STATE OF GEORGIA

TMDL IMPLEMENTATION PLAN

FISH CONSUMPTION GUIDELINES DUE TO TOXAPHENE IN DUPREE AND TERRY CREEK

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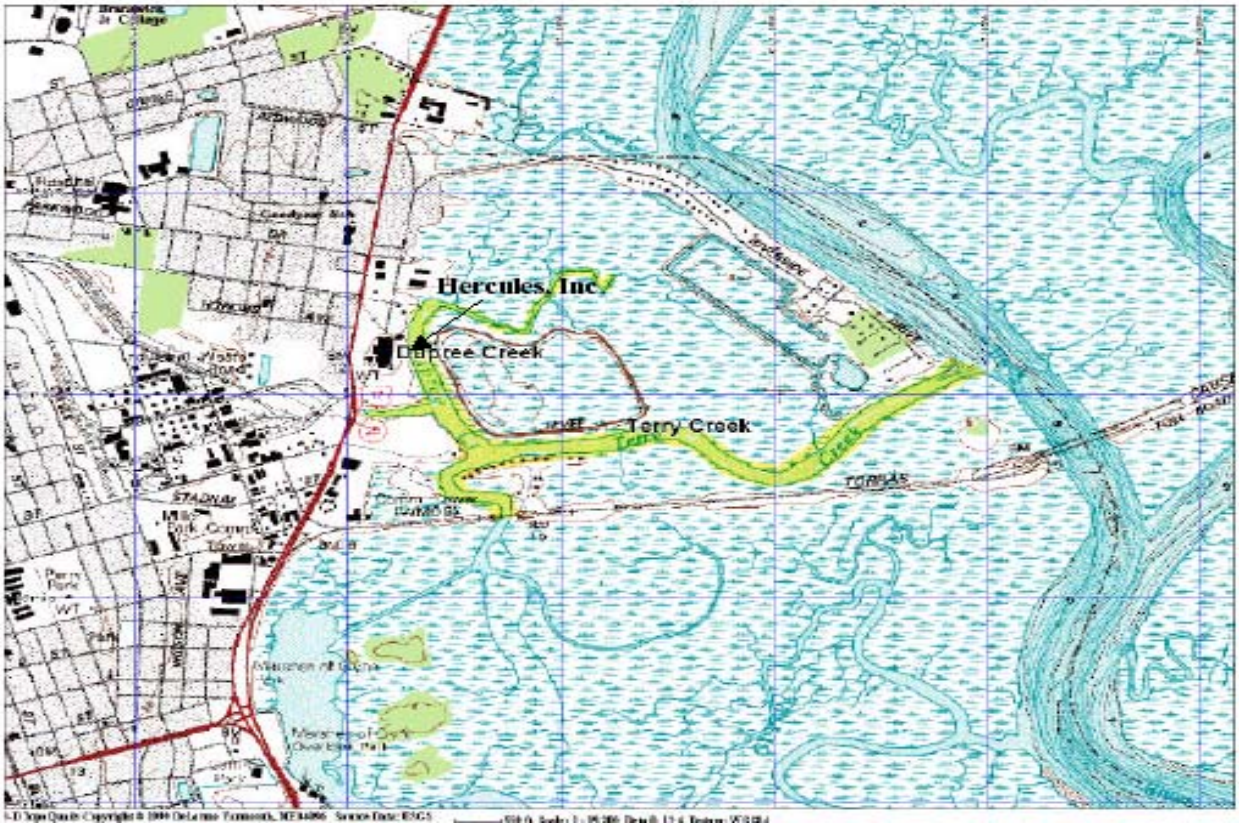
TMDL Implementation Plans are platforms for establishing a course of actions to restore the quality of impaired water bodies in a watershed. They are intended as a continuing process that may be revised as new conditions and information warrant. Procedures will be developed to track and evaluate the implementation of the management practices and activities identified in the plans. Once restored, appropriate management practices and activities will be continued to maintain the water bodies.

IMPACTED SEGMENTS

Figure 1



Impaired Waterbody*	Impaired Stream Location	River Basin
1. Dupree Creek		Satilla River
2. Terry Creek		Satilla River

INTRODUCTION

At the request of the State of Georgia (USEPA, Region 4, 2001), the U.S. Environmental Protection Agency (EPA) Region 4 established (July, 2, 2001) a Total Maximum Daily Load (TMDL) for total toxaphene in Dupree Creek and an adjoining portion of Terry Creek near Brunswick, Georgia. These segments were listed on the State of Georgia 2000 and 2002 Section 303(d) lists as not supporting their designated use due to the potential for toxaphene contamination in fish tissue. The Georgia Department of Natural Resources issued the fish consumption guidelines for these segments due to the potential for contamination during a sediment remediation project addressing toxaphene contaminated sediments related to the Terry Creek Superfund Site (Site).

Potential toxaphene contamination in the listed segments is likely a result of historical discharges of toxaphene that have become embedded in the estuarine sediments; as well as discharges from an National Pollutant Discharge Elimination System (NPDES) outfall which receives wash-off from the Site. Hercules, Inc. has intermittently exceeded its NPDES permitted discharge limit for toxaphene in the past. Toxaphene contamination in the sediments is documented in a consultant report (Hercules, Inc., 1998).

The wasteload and load allocation cumulatively for this system should not cause or contribute to exceedences of the aquatic life criterion of 0.0002 ug/l. However, the amount of the current background sources and nonpoint sources of toxaphene to this system are not quantifiable given present laboratory detection limits. It is expected that the Superfund process will provide the information needed to make this determination during a subsequent phase of the TMDL.

DISCUSSION OF POLLUTANT

Toxaphene is the trade name for an organochlorine pesticide widely used during the 1970s in the United States that is comprised of a mixture of at least 670 chlorinated camphenes. This pesticide readily binds to soils and sediment with a soil half-life of 1 to 14 years. This substance is known to bioaccumulate in the fatty tissue of fish exposed to the substance. Toxaphene was banned for most uses in the U.S. in 1982, and banned for all uses in 1990.

WATER BODIES/STREAMS COVERED IN THIS PLAN:

On the 2000 §303(d) list, the State of Georgia has identified all of Terry and Dupree Creeks north of Torras Causeway to 1/2 mile west of the confluence with the Back River as not supporting their designated use due to the issuance of fish consumption guidelines because of toxaphene contamination.

PHASE I TMDL

The Georgia Environmental Protection Division established an NPDES permit limit of a daily average discharge toxaphene concentration of 0.00081 ug/l from the Hercules facility. As with background and nonpoint sources, laboratory method detection limits for measuring toxaphene in organic wastewater are several orders of magnitude higher than either the permit limit or the standard. While the TMDL will ultimately develop targets and reductions needed to meet water quality standards, the Phase 1 TMDL will maintain current permit limits while acknowledging that ongoing Superfund activities will provide information that can help quantify the toxaphene load being released into Dupree and Terry Creeks.

POLLUTANT SOURCES/PROBLEM DEFINITION

Potential toxaphene contamination in the listed segments is likely a result of historical discharges of toxaphene that have become embedded in the estuarine sediments, as well as discharges from an NPDES outfall which receives wash-off from the Site.

The listing of toxaphene resulted from the assessment of water quality data performed by Georgia Department of Natural Resources Fish and Wildlife toxicologists (Georgia Department of Natural Resources, 2000). Specifically, fish consumption guidelines were issued in these two estuarine tributaries due to the cleanup of toxaphene contaminated sediments at the Terry Creek Site.

Hercules Inc. is an NPDES permitted industrial discharger to Dupree Creek (NPDES #GA0003735). This facility was, at one time, a producer of toxaphene. This industrial facility currently produces products derived from the extract of aged pine stumps as well as specialty organic chemical products. The Terry Creek site is contaminated with toxaphene that is conveyed to the creek with storm water runoff. Hercules has intermittently exceeded its permitted discharge limit for toxaphene in the past. While sampling conducted by the Georgia Department of Natural Resources, Skidaway Institute, and contractors to Hercules, Inc. did not detect measurable levels of technical grade toxaphene in the water column or in fish and animal tissue, considerable contamination of the sediments in and around Terry and Dupree Creeks was documented (Hercules, Inc., 1998).

PLAN FOR IMPLEMENTATION OF TMDL/MONITORING PLAN

The Terry Creek Site was listed on the National Priorities List (NPL). Superfund response activities are currently ongoing at the site. A removal action did take place, which included the dredging of sediments that resulted in the issuance of the Georgia fish consumption guidelines. The Superfund cleanup process proceeds through several phases. Usually, after a site is listed or proposed for listing on the NPL, a remedial investigation/feasibility study (RI/FS) is performed at the site. This is the phase of the cleanup process currently being undertaken at the site. The remedial investigation

serves as the mechanism for collecting data to characterize site conditions. As part of this investigation, Hercules will take steps to quantify the amount of toxaphene being released into Dupree and Terry Creeks and assess the risk of those releases to human health and the environment. The FS is the mechanism for the development, screening, and detailed evaluation of alternative remedial actions for the toxaphene contamination at the Site. Data collected in the RI influence the development of remedial alternatives in the FS, which in turn affect the data needs and scope of any necessary treatability studies and additional field investigations. The RI/FS results in a Record of Decision (ROD), which is a public document that explains which cleanup alternatives will be used to clean up a Superfund site.

As Hercules works with U.S. EPA Waste Management Division personnel to further delineate contamination and assess risk to humans and other living organisms, the facility's permit should be revisited regarding the developing science associated with toxaphene measuring and reporting techniques. As detection limits become lower with developing and emerging technologies to measure and define toxaphene contamination, the role of the discharge limit will increase in importance. The facility should continue monthly monitoring until the State permitting agency determines that the facility no longer poses a risk for release of toxaphene into the environment above the aquatic life criterion concentration of 0.0002 ug/l.

Background concentrations of toxaphene in the environment may exist in the watershed from other sources such as legacy loads. Toxaphene was a widely used pesticide in the 1970s. As data is developed, attempts to quantify the background loading may require revision to the TMDL. The ongoing Superfund RI/FS will provide information that can help to quantify the toxaphene load being released into Dupree and Terry Creeks. The Superfund ROD will then identify the selected cleanup alternative and establish the level of cleanup expected to be achieved through implementation of the remedy selected in the ROD. The ROD will address both background load (contaminated sediments) and point source load (effluent released through the Hercules NPDES discharge). This information will be critical to potential future revisions of this TMDL.

EPA anticipates that future Superfund activities will result in Dupree and Terry Creeks attaining water quality standards for toxaphene through reductions in both point source and nonpoint source toxaphene loadings to the waterbodies. The Comprehensive Environmental Response Compensation and Liability Act (CERCLA) provides that the remedy selected in the ROD achieve all applicable and relevant and appropriate requirements, including water quality standards EPA expects necessary load reductions can be achieved through implementation of the ROD for the Terry Creek Site. Ongoing Superfund activities related to the Site provide reasonable assurance that the necessary reductions in toxaphene can be achieved in this system. Therefore, Phase 1 of this TMDL establishes the TMDL target at concentrations consistent with the most protective water quality criterion. Follow-up monitoring conducted in relation to ongoing Superfund activities and any other necessary monitoring will determine the necessity for additional reductions.

EDUCATION/OUTREACH ACTIVITIES

The Environmental Protection Division will continue to provide guidance and education to the public on all water quality issues through outreach by the Water Protection Branch. When necessary, Department of Natural Resources will issue fish consumption guidelines and identify specific stream segments where there is a problem, and list all known species of fish with toxaphene contamination and how often they may be consumed. These guidelines are updated annually in the DNR publication *Guidelines for Eating Fish from Georgia Waters: 2002 Update*.

The US EPA Region 4 Emergency Response and Removal Branch will be conducting Public Availability Sessions and Proposed Plan Public Meetings in the future.

STAKEHOLDERS

Major stakeholders are the City of Brunswick, Georgia Department of Natural Resources, and Hercules, Inc.

REFERENCES

Georgia Department of Natural Resources, 2000. *Guidelines for Eating Fish from Georgia Waters- 2000 Update.*

Hercules Incorporated, March 1998. *Interim Status Data Package- Terry Creek Site, Brunswick, Georgia.* Prepared for Hercules Inc. by Geosyntec Consultants. Project Number GL0411-06.

USEPA, September 1999. *Fact Sheet: Toxaphene Update: Impact on Fish Advisories.* Office of Water. EPA-823-F-99-018.